

ABSTRACT OF THE DISCLOSURE

A modified aluminum oxy compound(A) obtained by reacting an aluminum oxy compound(a), water (b) and a compound having a hydroxyl group(c); a polymerization catalyst component comprising the modified aluminum oxy compound; a polymerization catalyst obtained by contacting said modified aluminum oxy compound(A), a transition metal compound(B) and optionally an organoaluminum compound(C) and a specified boron compound; and a process for producing an olefin polymer or an alkenyl aromatic hydrocarbon polymer with the polymerization catalyst.